Integrating NASA Institutional Management Efforts through Spatial Data Standards FY04

Progress on NASA FY03 Efforts

- Completed addition of all 14 NASA Documents identified in the Statement of Work (NPDs and NPGs)
- Added 4 US Code Sections and 18 Code of Federal Regulation Sections referenced in the basic NASA documents
- Correlated the NASA documents with the appropriate laws and SDS entity sets

Additional documents added

- Researched and entered 18 additional NASA NPDs and NPGs not identified in the Statement of Work
- Added 19 US Code sections and 24 Code of Federal Regulation sections referenced in the additional NASA documents
- Correlated the additional NASA documents with the appropriate laws and SDS entity sets

Additional work

- Correlated all 32 NASA documents with the associated 9 KM business lines
- Began correlating the NASA documents with the CADD/GIS Center Spatial Data Standards at the entity class level (~170 entity classes)

Demonstration

CADD/GIS Center for Facilities, Infrastructure, and Environment

Real Property Management Hom e

NASA Policy Documents and relat ed information

Why are these efforts important?

- Consolidated location for NASA institutional management policy documents and laws saves time searching for electronic copies of policies and referenced laws
- Correlation between NASA information and the CADD/GIS spatial data standards supports information sharing and the development of an integrated geospatial approach to institutional management

The SDS provides the framework for data collection and data sharing

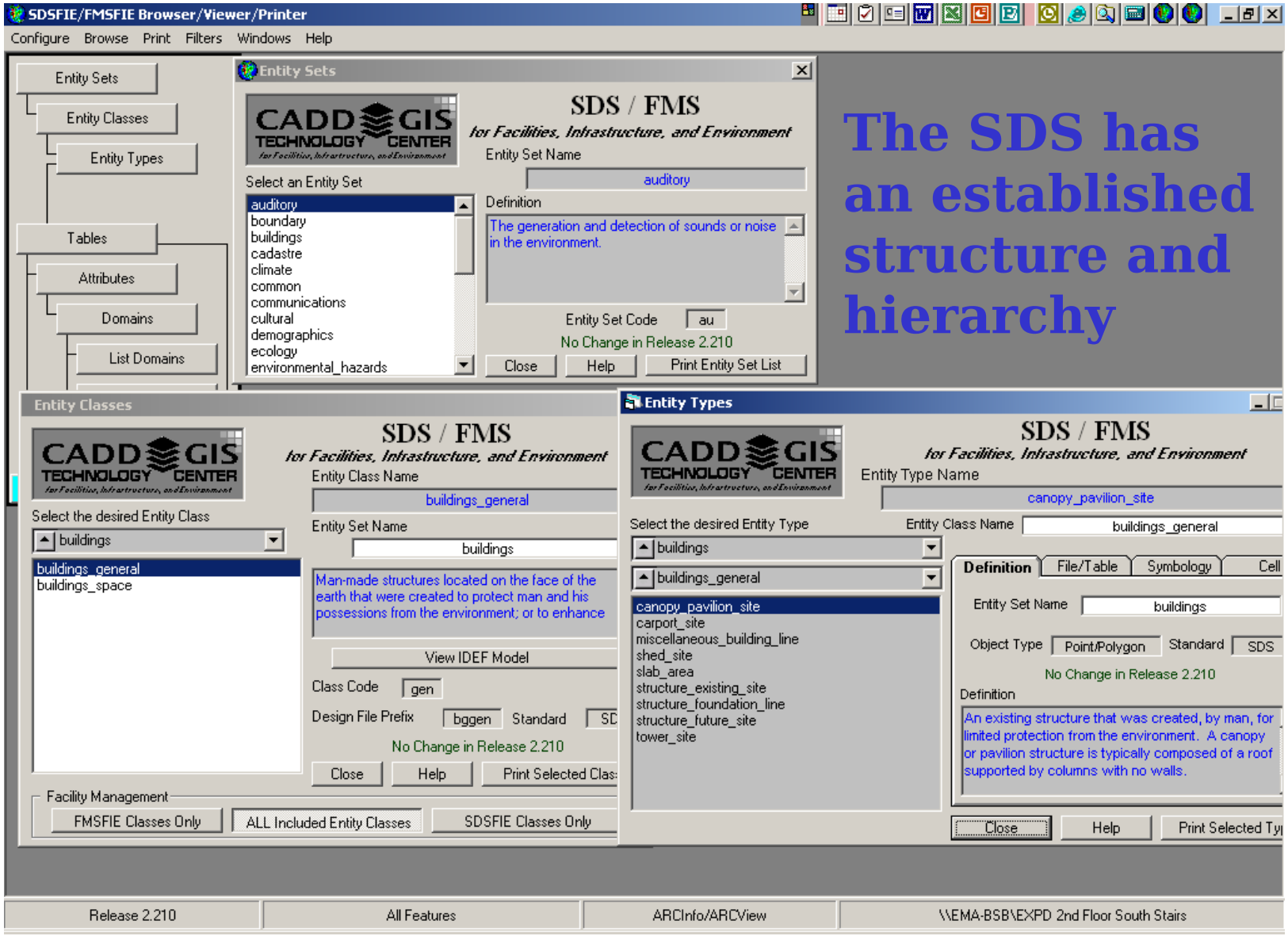
- SDS is the ANSI standard data model for geospatial information
- Use of the SDS ensures consistent data collection and naming conventions
- Consistency in data collection and data naming supports efficient and accurate institutional management

Consistency supports efficient institutional management efforts

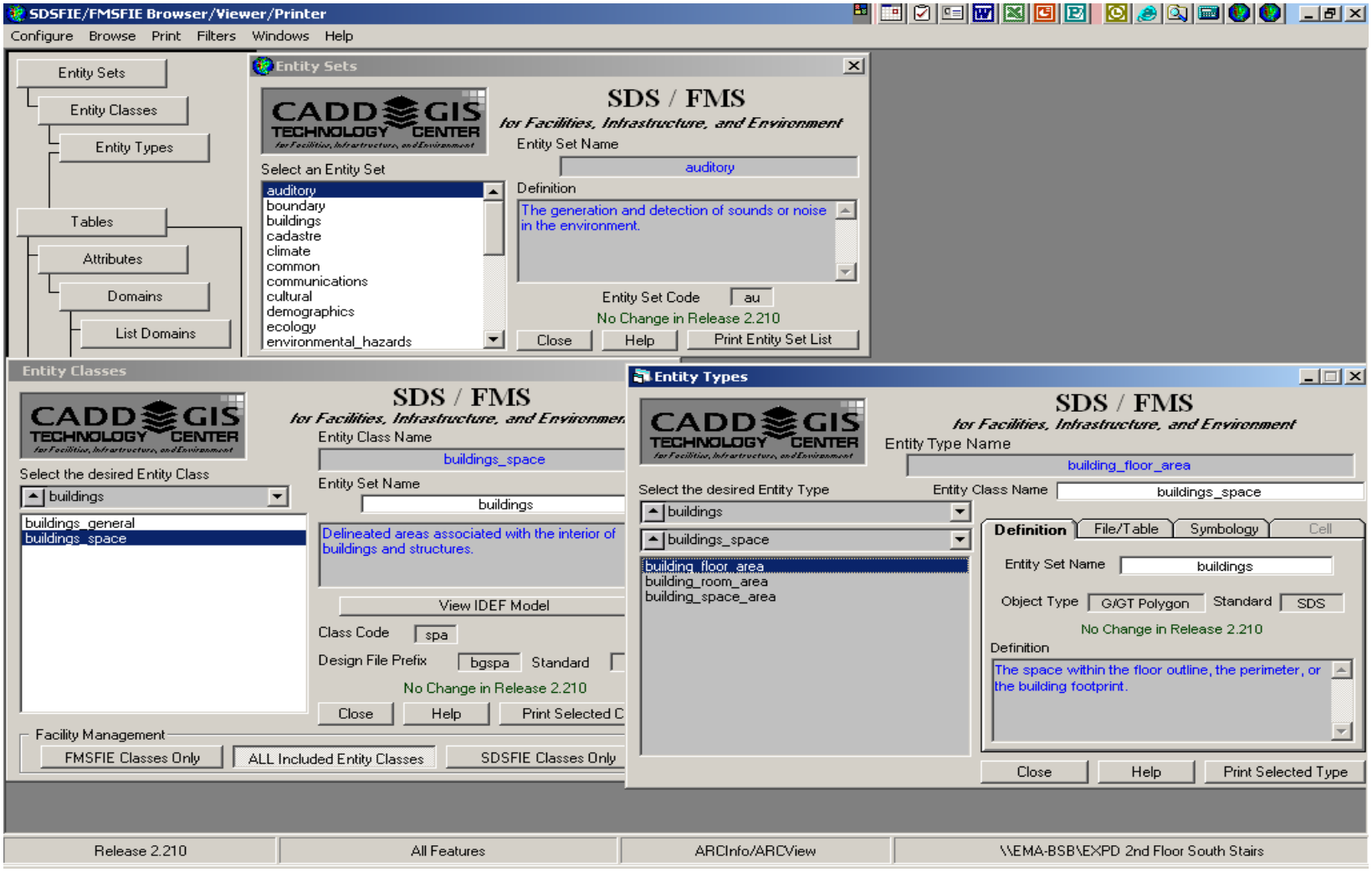
- Reduced data entry error and redundancy
- Complete data sets collected for all assets
- More accurate searches and reporting
- Reduced geospatial data costs
  - Data can be shared across NASA organizations
  - NASA can better leverage work done by other federal agencies

The SDS establishes the data model for the geospatial database structure

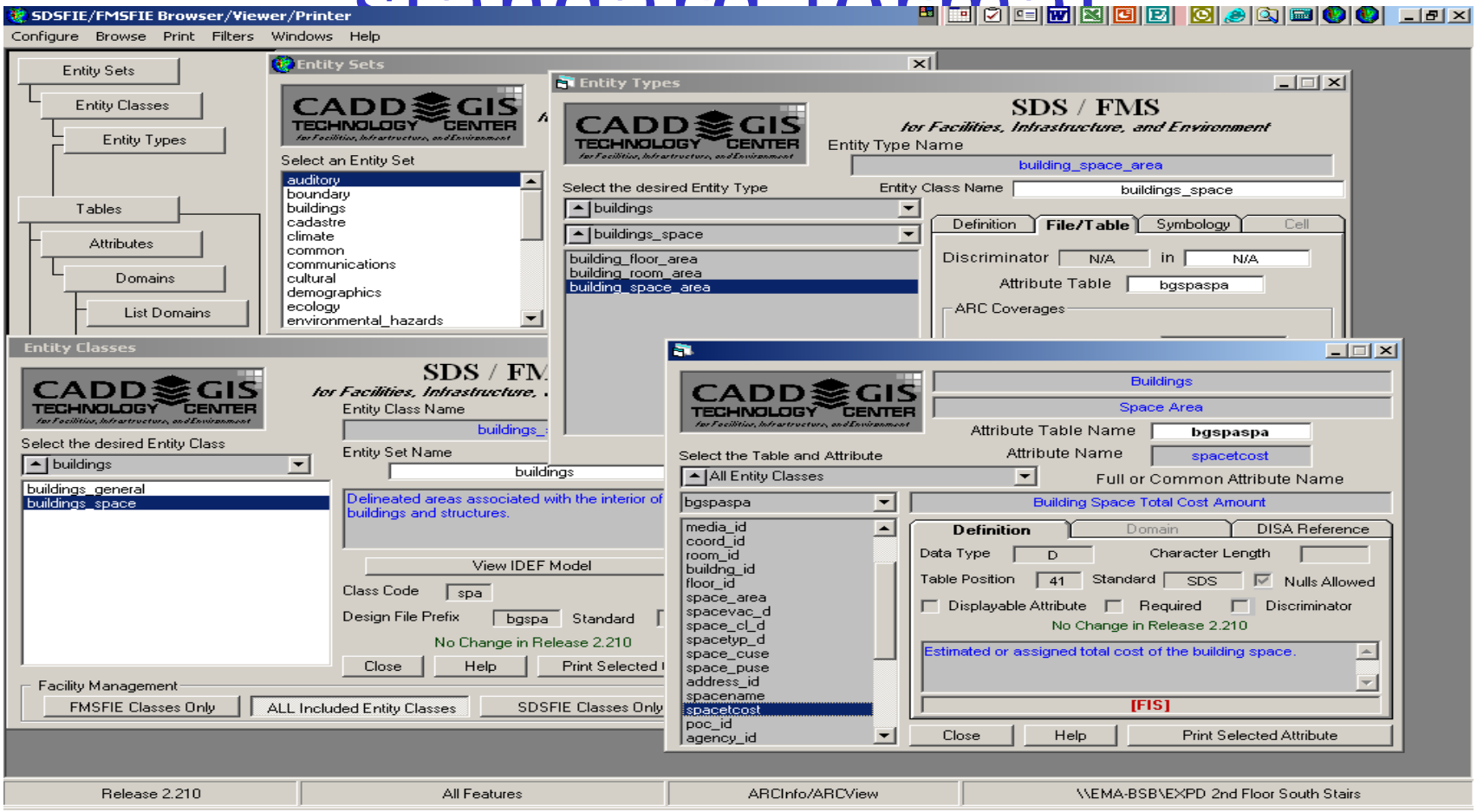
- Data tables
- Data attributes
- Data names
- Relationships among data
- Database hierarchy reflects the SDS hierarchy
  - Entity sets, classes, types
  - Attributes, domains



The SDS has an established structure and hierarchy


SDSFIE/FMSFIE Browser/Viewer/Printer
Configure Browse Print Filters Windows Help
Entity Sets
Entity Classes
Entity Types
Tables
Attributes
Domains
List Domains
Entity Sets
CADD GIS TECHNOLOGY CENTER
SDS / FMS
for Facilities, Infrastructure, and Environment
Entity Set Name
auditory
Select an Entity Set
auditory
boundary
buildings
cadastre
climate
common
communications
cultural
demographics
ecology
environmental_hazards
Definition
The generation and detection of sounds or noise in the environment.
Entity Set Code
au
No Change in Release 2.210
Close
Help
Print Entity Set List
Entity Classes
CADD GIS TECHNOLOGY CENTER
SDS / FMS
for Facilities, Infrastructure, and Environment
Entity Class Name
buildings_space
Select the desired Entity Class
buildings
Entity Set Name
buildings
buildings_general
buildings_space
Delineated areas associated with the interior of buildings and structures.
View IDEF Model
Class Code
spa
Design File Prefix
bgspa
Standard
No Change in Release 2.210
Close
Help
Print Selected C
Facility Management
FMSFIE Classes Only
ALL Included Entity Classes
SDSFIE Classes Only
Entity Types
CADD GIS TECHNOLOGY CENTER
SDS / FMS
for Facilities, Infrastructure, and Environment
Entity Type Name
building_floor_area
Select the desired Entity Type
Entity Class Name
buildings_space
buildings
buildings_space
building_floor_area
building_room_area
building_space_area
Definition
File/Table
Symbology
Cell
Entity Set Name
buildings
Object Type
G/GT Polygon
Standard
SDS
No Change in Release 2.210
Definition
The space within the floor outline, the perimeter, or the building footprint.
Close
Help
Print Selected Type
Release 2.210
All Features
ARCInfo/ARCView
\\EMA-BSB\EXPD 2nd Floor South Stairs

Information on the building's internal space is stored in a standard format



NASA policy documents are now tied into the SDS structure

- The relationship of NASA policy documents provide the foundation for an integrated approach to real property cost accounting and institutional management through a common operational map.
- Users can track real property assets and liabilities visually and have immediate access to relevant laws as well.

FY04 Recommendations further progress against integration goal

- **Step 1 -** Build a relationship between NASA investment categories and the SDS to allow NASA to map and track assets by both established ID and SDS
- **Step 2 -** Analyze NASA facilities management data sets and sources against the SDS to ensure the standard is adequate to support NASA's information architecture
- **Step 3 -** Convert NASA geospatial data into the SDS format according to NASA-established priorities.

Step 1 – Correlate NASA Investment Categories with the SDS

- Building a relationship between NASA's investment categories and the spatial data standard entity classes ties the tabular data to the geospatial data for incorporation into a common operational picture
- This correlation further establishes the foundation needed for geospatial tracking of asset status, cost and other information on NASA real property

Step 2 – NASA Facilities SDS Gap Analysis

- Use of the Standards depends on its adequacy for NASA's particular business concerns
- Review of NASA's data requirements against the SDS/FM standard to identify any "gaps" that would prevent NASA from effectively using the Center's standard information model
- NASA input would enhance the Standards and support better data sharing

Step 3 – NASA Data Conversion Effort

- Implement existing NASA data into a database that follows the SDS structure
- Identify data required by the SDS but not yet gathered by NASA
- Collect and incorporate required data
- Include keys that tie to financial databases to allow visual cost accounting on the common operational map

The Navy's ICBM provides an additional structure for cost accounting

- The Navy's Installation Core Business Model (ICBM) provides a business oriented view of activities in all areas of an operation for accurate cost allocation
- The ICBM subfunctions are tied to the SDS for data sharing
- The ICBM approach benefits the entire Navy
  - Streamlined cost collection
  - Accurate and consistent data reporting
  - Identification of the real cost of doing business

NASA's cost collection structure can be similarly correlated to the SDS

- Consistent cost accounting by business area
- Costs collected by business areas to ensure accurate representation of business expenses
- Normalized geospatial information using the SDS/FMS model allows data sharing across NASA sites

Conclusion

- NASA is moving towards a common operational picture
- The SDS is essential for accuracy and consistency in that common picture
- The SDS allows for efficient data sharing and cost savings
- An SDS-compliant system can be implemented at NASA's pace according to NASA priorities